

tude of bright reflecting parts, whose Figure 'tis no easie matter to determine, as he that examines it shall find; for every new position of it to the light makes it perfectly seem of another form and shape, and nothing what it appear'd a little before; nay, it appear'd very differing oftentimes from so seemingly inconsiderable a circumstance, that the interposing of ones hand between the light and it, makes a very great change, and the opening or shutting a Casement and the like, very much diversifies the appearance. And though, by examining the form of it very many ways, which would be tedious here to enumerate, I suppose I have discover'd the true Figure of it, yet oftentimes, upon looking on it in another posture, I have almost thought my former observations deficient, though indeed, upon further examination, I have found even those also to confirm them.

These threads therefore I find to be a congeries of small *Lamina* or plates, as *eeee*, &c. each of them shap'd much like this of *abcd*, in the fourth Figure, the part *ac* being a ridge, prominency, or stem, and *b* and *d* the corners of two small thin Plates that grow unto the small stalk in the middle, so that they make a kind of little feather; each of these Plates lie one close to another, almost like a company of sloping ridge or gutter Tiles; they grow on each side of the stalk opposite to one another, by two and two, from top to bottom, in the manner express'd in the fifth Figure, the tops of the lower covering the roots of the next above them; the under side of each of these laminated bodies, is of a very dark and opacous substance, and suffers very few Rays to be trajected, but reflects them all toward that side from whence they come, much like the foil of a Looking-glass; but their upper sides seem to me to consist of a multitude of thin plated bodies, which are exceeding thin, and lie very close together, and thereby, like mother of Pearl shells, do not onely reflect a very brisk light, but tinge that light in a most curious manner; and by means of various positions, in respect of the light, they reflect back now one colour, and then another, and those most vividly.

Now, that these colours are onely *fantastical* ones, that is, such as arise immediately from the refractions of the light, I found by this, that water wetting these colour'd parts, destroy'd their colours, which seem'd to proceed from the alteration of the reflection and refraction. Now, though I was not able to see those hairs at all transparent by a common light, yet by looking on them against the Sun, I found them to be ting'd with a darkish red colour, nothing a-kin to the curious and lovely greens and blues they exhibited.

What the reason of colour seems to be in such thin plated bodies, I have elsewhere shewn. But how water cast upon those threads destroys their colours, I suppose to be perform'd thus; The water falling upon these plated bodies from its having a greater congruity to Feathers than the Air, insinuates it self between those Plates, and so extrudes the strong reflecting Air, whence both these parts grow more transparent, as the *Microscope* informs, and colourless also, at best retaining a very faint and dull

dull colour. But this wet being wasted away by the continual evaporations and steams that pass through them from the Peacock, whilst that Bird is yet alive, the colours again appear in their former luster, the *interstitia* of these Plates being fill'd with the strongly reflecting Air.

The beauteous and vivid colours of the Feathers of this Bird, being found to proceed from the curious and exceeding smallness and fineness of the reflecting parts, we have here the reason given us of all those gauderies in the apparel of other Birds also, and how they come to exceed the colours of all other kinds of Animals, besides Insects; for since (as we here, and elsewhere also shew) the vividness of a colour, depends upon the fineness and transparency of the reflecting and refracting parts; and since our *Microscope* discovers to us, that the component parts of feathers are such, and that the hairs of Animals are otherwise; and since we find also by the Experiment of that Noble and most Excellent Person I formerly named; that the difference between Silk and Flax, as to its colour, is nothing else (for Flax reduc'd to a very great fineness of parts, both white and colour'd, appears as white and as vivid as any Silk, but loses that brightness and its Silken aspect as soon as it is twisted into thread, by reason that the component parts, though very small and fine, are yet pliable flakes, and not cylinders, and thence, by twisting, become united into one opacous body, whereas the threads of Silk and Feathers retain their lustre, by preserving their cylindrical form intire without mixing; so that each reflected and refracted beam that composes the gloss of Silk, preserves its own property of modulating the light intire); And since we find the same confirm'd by many other Experiments elsewhere mentioned, I think we may safely conclude this for an Axiome, that wheresoever we meet with transparent bodies, spun out into very fine parts, either cleer, or any ways ting'd, the colours resulting from such a composition must necessarily be very glorious, vivid, and cleer, like those of Silk and Feathers. This may perhaps hint some usefull way of making other bodies, besides Silk, be susceptible of bright tinctures, but of this onely by the by.

The changeable colour'd Feathers also of Ducks, and several other Birds, I have found by examination with my *Microscope*, to proceed from much the same causes and textures.

Observ. XXXVII. Of the Feet of Flies, and several other Insects.

The foot of a Fly (delineated in the first Figure of the 23. Scheme, which represents three joints, the two Tallons, and the two Pattens in a flat posture; and in the second Figure of the same Scheme, which represents onely one joint, the Tallons and Pattens in another posture) is of a most admirable and curious contrivance, for by this the Flies are enabled to walk against the sides of Glass, perpendicularly upwards, and to

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